Global Health and Lifestyle Indicators by Country and Gender

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Project Overview

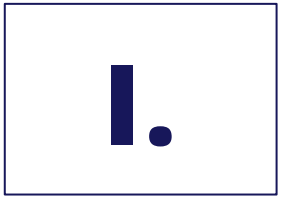
Objective

The goal of this project is to uncover insights into global health indicators by comparing data on alcohol and tobacco use, physical activity, and overweight prevalence across countries and genders. This analysis aims to identify potential factors that contribute to healthier lifestyle choices and patterns within populations.

Motivation

Understanding human behavioral trends is essential for both public and private sector organizations. By identifying behavior patterns, public institutions can more effectively target specific health issues and develop initiatives to improve population well-being.

For private companies, refined consumer profiles based on health behavior can help tailor products and services to better serve their audiences, whether profit-driven or non-profit. This research aims to encourage social initiatives geared towards fostering community health and development.



I. Exploratory Data Analysis (EDA)

Selected datasets

The data is sourced from the World Health Organization's (WHO) Global Health Observatory and includes the following four health indicators:

- Alcohol Consumption (2020)
- Tobacco Consumption (2020)
- Insufficient Physical Activity Among Adults (Estimated 2022)
- Overweight Prevalence Among Adults (2022)

World Health Organization

Alcohol dataset

Not normally distributed

```
alcohol_df.head(3)
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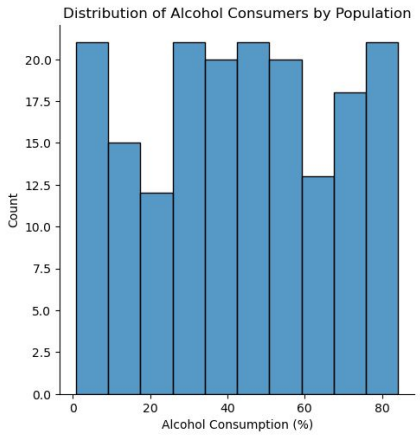
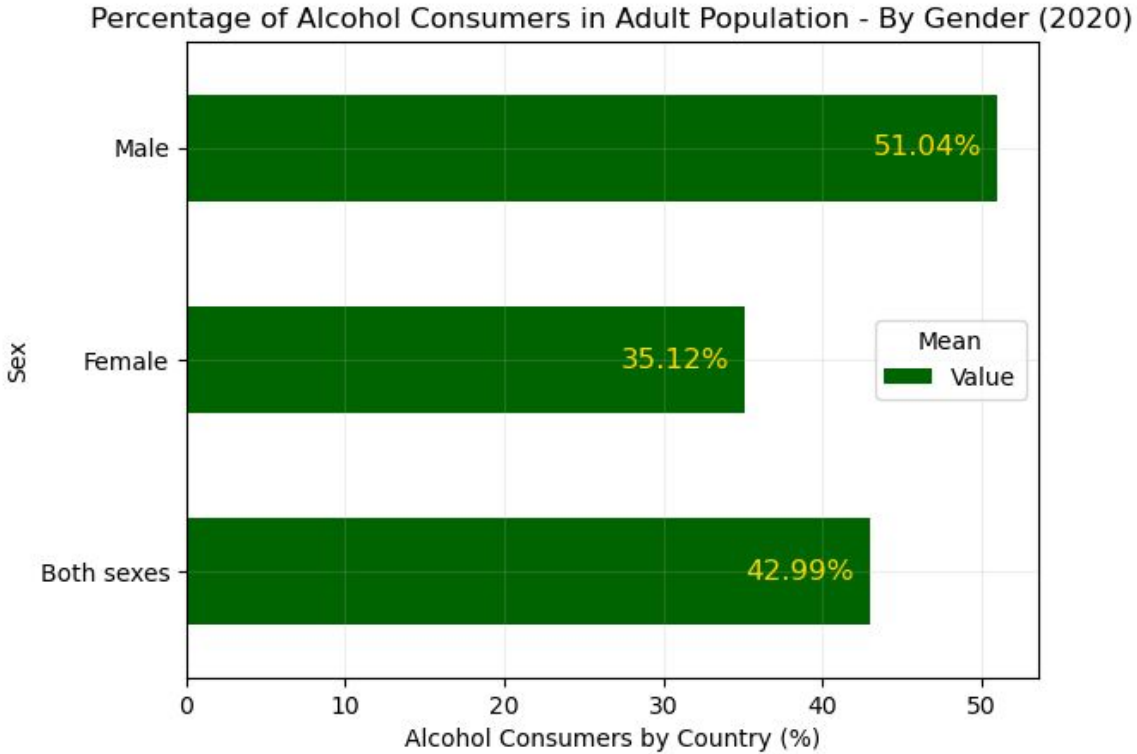
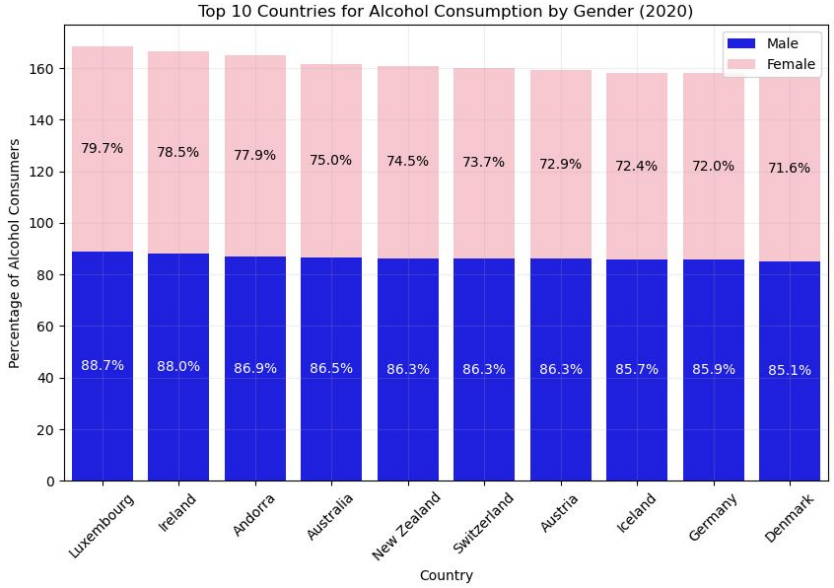
	Country	Sex	Value
0	Afghanistan	Female	1.10
1	Afghanistan	Both sexes	2.06
2	Afghanistan	Male	3.01

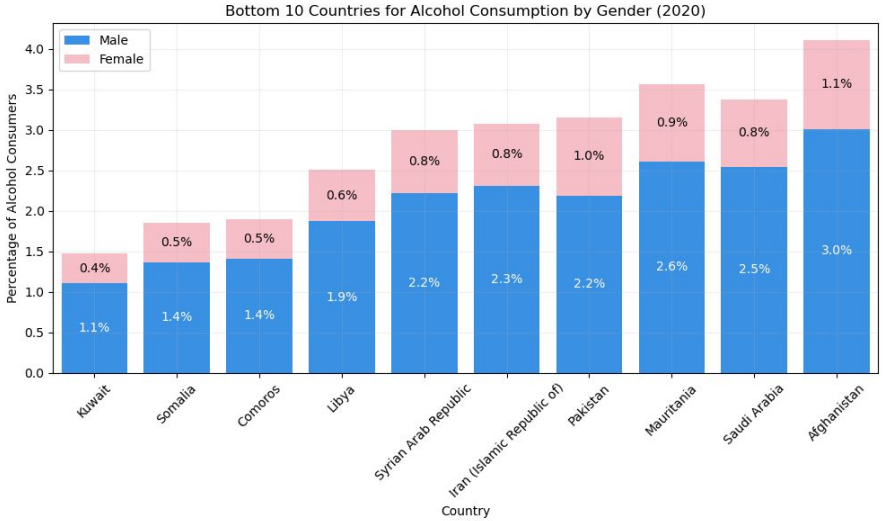




Results in Alcohol consumption are closely linked to cultural and religious contexts.

- At the top of the rank, high-income Western countries predominate.
- On the other hand, countries at the bottom of the rank, are predominantly Islamic countries, where alcohol consumption is often restricted or prohibited for religious and cultural reasons.

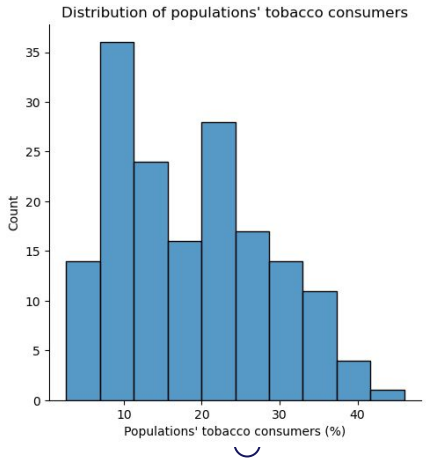


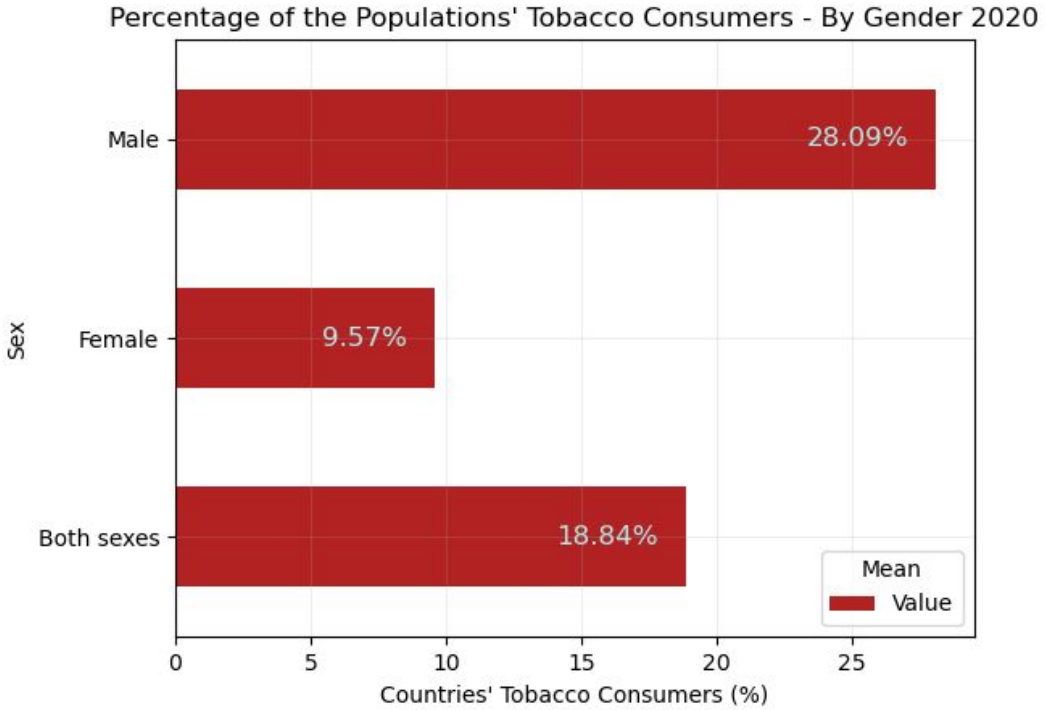


Tobacco dataset

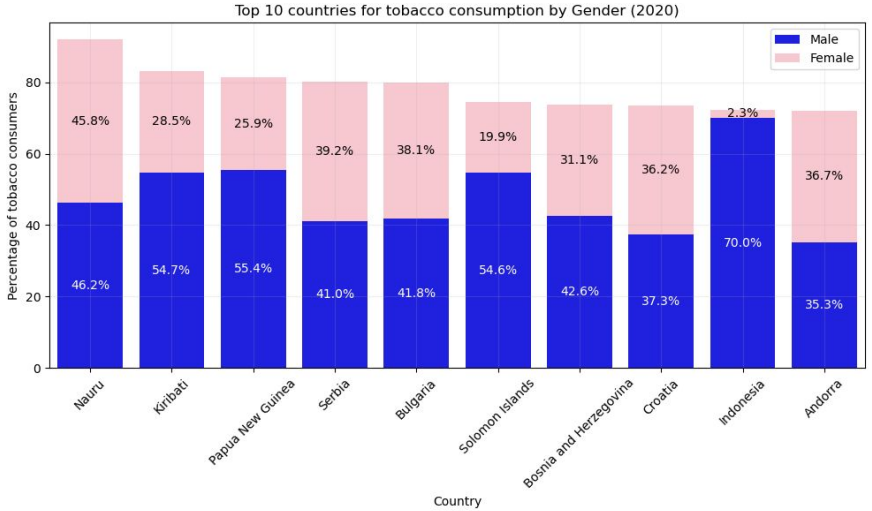
Not normally distributed

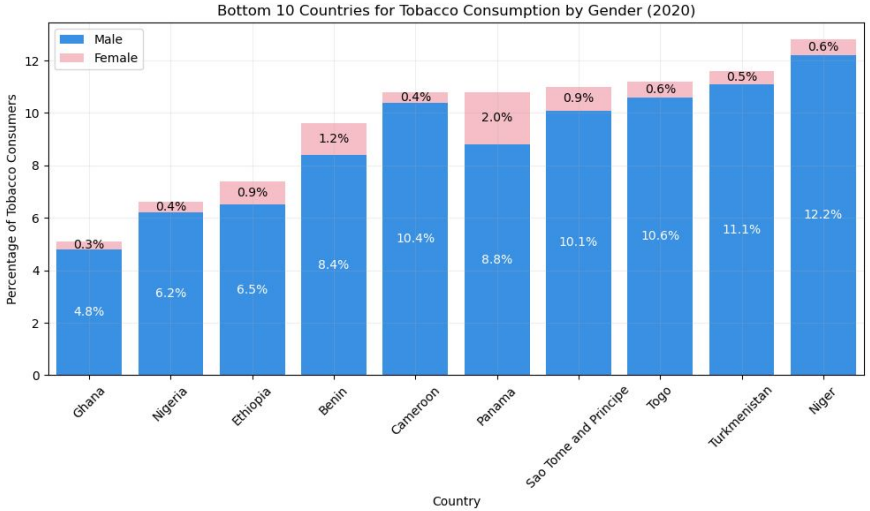
	Country	Sex	Value
0	Afghanistan	Male	17.1
1	Afghanistan	Female	2.3
2	Afghanistan	Both sexes	9.7





Tobacco consumption might be decreased due to regional regulations or decreased by the lack of it. Cultural acceptance and economic factors might be correlated, as well.

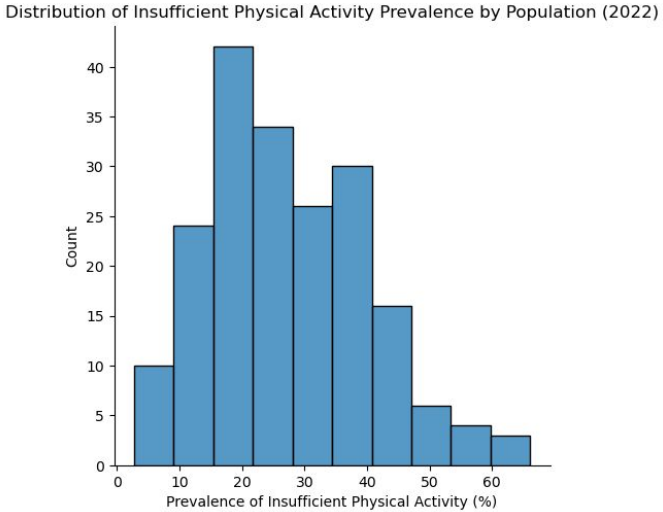


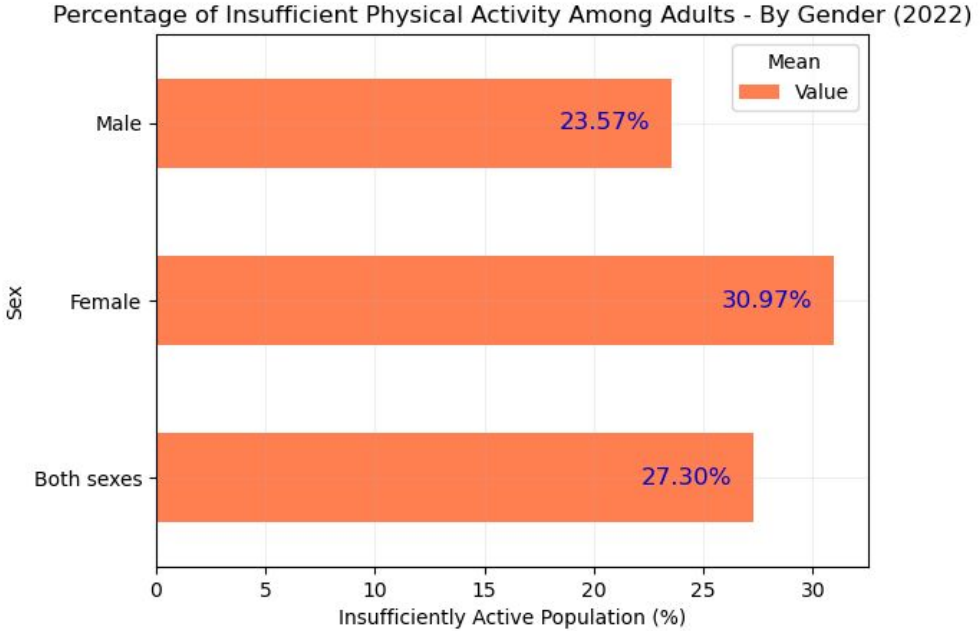


Prevalence of Insufficient Physical Activity dataset

Not normally distributed

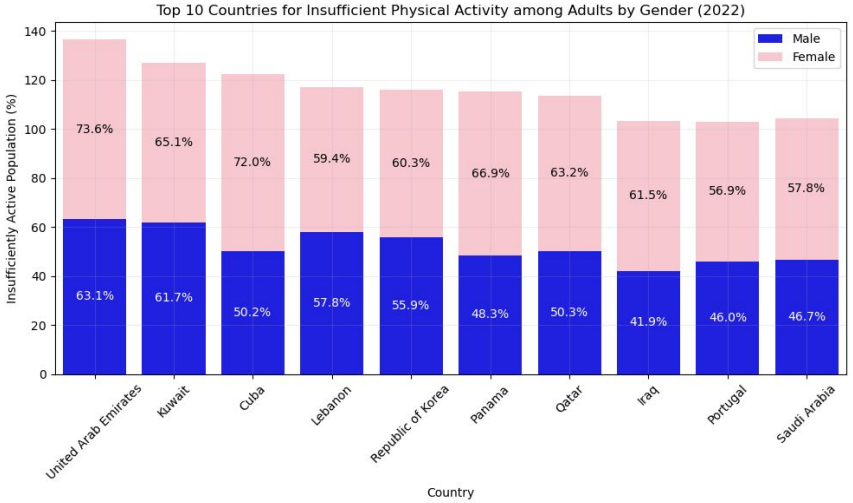
	Country	Sex	Value
0	Afghanistan	Male	20.02
1	Afghanistan	Both sexes	33.36
2	Afghanistan	Female	46.03

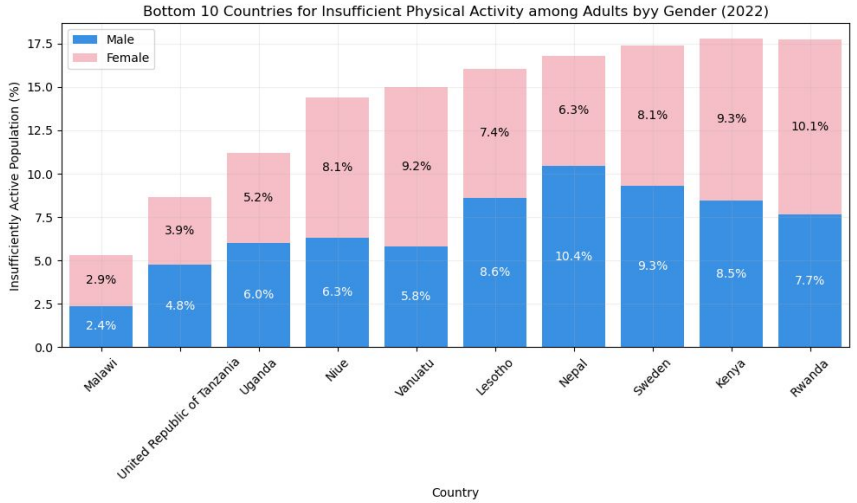




Regarding physical activity, multiple factors could impact population habits, such as public health initiatives, lack of recreational public facilities, and cultural traditions likely to promote sedentarism.

Low-income countries often have populations that engage in manual labor, which can contribute to higher physical activity levels. However, Sweden's traditionally active urban environments can lead to less activity for some, but comprehensive public health policies promote active lifestyles.

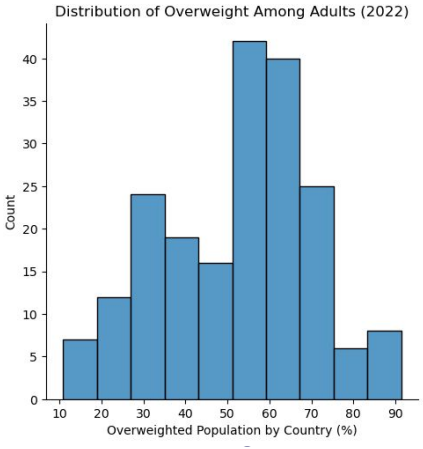


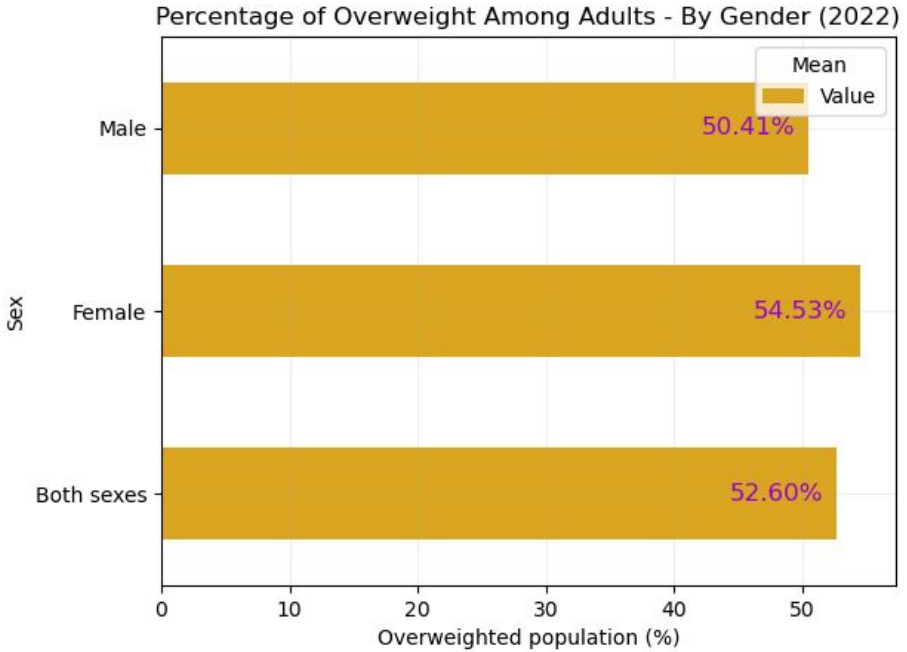


Prevalence of Overweight dataset

Not normally distributed

	Country	Sex	Value
0	Afghanistan	Male	44.07
1	Afghanistan	Both sexes	48.57
2	Afghanistan	Female	52.74

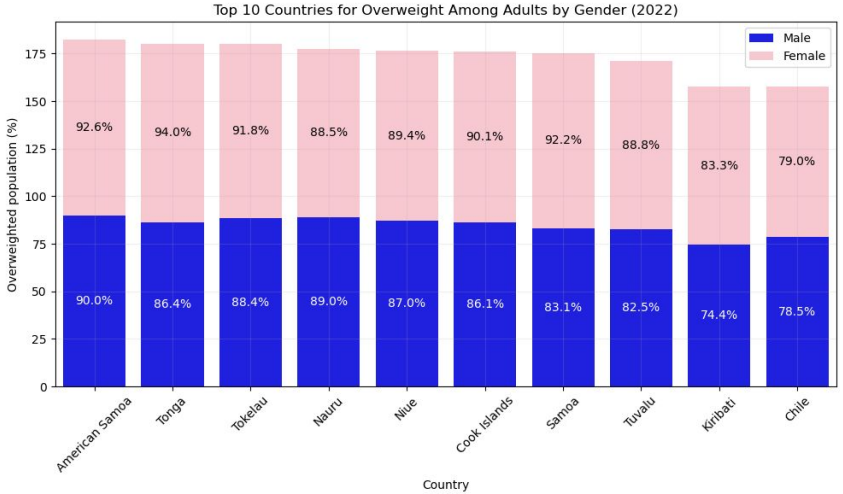


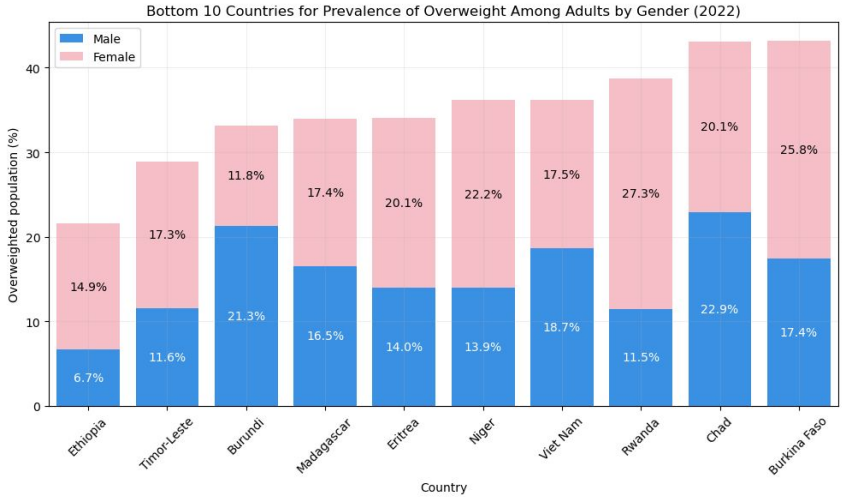


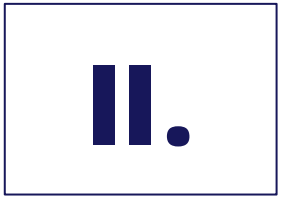
We could conclude dietary habits determine whether a country has more or less overweighted people.

Once again, results may suggest, the impact of cultural and economic factors on weight rates.

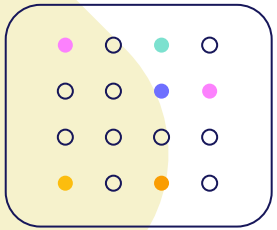
- Many Pacific Island nations like American Samoa, Tonga, Nauru, and Kiribati have diets high in processed foods and imported products, contributing to higher obesity rates. In addition, there may be less stigma associated with being overweight, which can affect social perceptions of body image and health.
- Chile has also experienced rising obesity rates due to changes in dietary habits, urbanization, and the availability of fast food.
- Lacking access to processed foods may contribute to lower overweight rates or increase as long as availability does so.







Hypothesis Testing



Alcohol Hypotheses

- ➔ **NullHypothesis(H_0):** Males' alcohol consumption = Females'
- ➔ **AlternativeHypothesis(H_a):** Males' alcohol consumption > Females'

Z-test formula for two proportions (Right-tailed Test)

Z value: 1.961971907943067
P-value: 0.024882877471860132
Reject the null hypothesis: Males consume more alcohol than females.

Tobacco Hypotheses

- ➔ **NullHypothesis(H_0):** Males' tobacco consumption = Females'
- ➔ **AlternativeHypothesis(H_a):** Males' tobacco consumption > Females'

Z-test formula for two proportions (Right-tailed Test)

Z value: 2.320947312298146
P-value: 0.010144843811244919
Reject the null hypothesis: Males consume more tobacco than females.

Physical Activity Hypotheses

- ➔ **NullHypothesis(H_0):** Females' prevalence of insufficient physical activity = Males'
- ➔ **AlternativeHypothesis(H_a):** Females' prevalence of insufficient physical activity > Males'

Z-test formula for two proportions (Right-tailed Test)

Z value: 1.081189639740694
P-value: 0.1398063827865368
Fail to reject the null hypothesis: There is no significant difference in physical activity prevalence between females and males.

Overweight Hypotheses

- ➔ **NullHypothesis(H_0):** Females' prevalence of overweight = Males'
- ➔ **AlternativeHypothesis(H_a):** Females' prevalence of overweight > Males'

Z-test formula for two proportions (Right-tailed Test)

Z value: 0.4694562815294669

P-value: 0.3193717636000796

Fail to reject the null hypothesis: There is no significant difference in overweight prevalence between females and males.

Overweight and Physical Activity Hypotheses

- **NullHypothesis(H_0):** There is no correlation between the prevalence of insufficient physical activity and the prevalence of overweight in countries.
- **AlternativeHypothesis(H_a):** Countries with more insufficient physical activity have a higher prevalence of overweight.

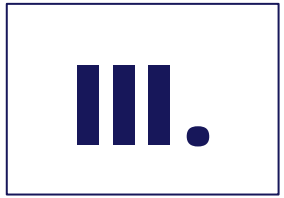
Z-test formula for two proportions (Right-tailed Test)

Z value: 3.1028757617213434

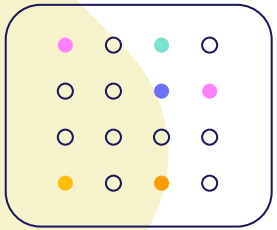
P-value: 0.024882877471860132

Reject the null hypothesis:

At a 95% confidence level, we found a statistically significant association suggesting that countries with more insufficiently active populations tend to have higher rates of overweight.



Correlation Testing

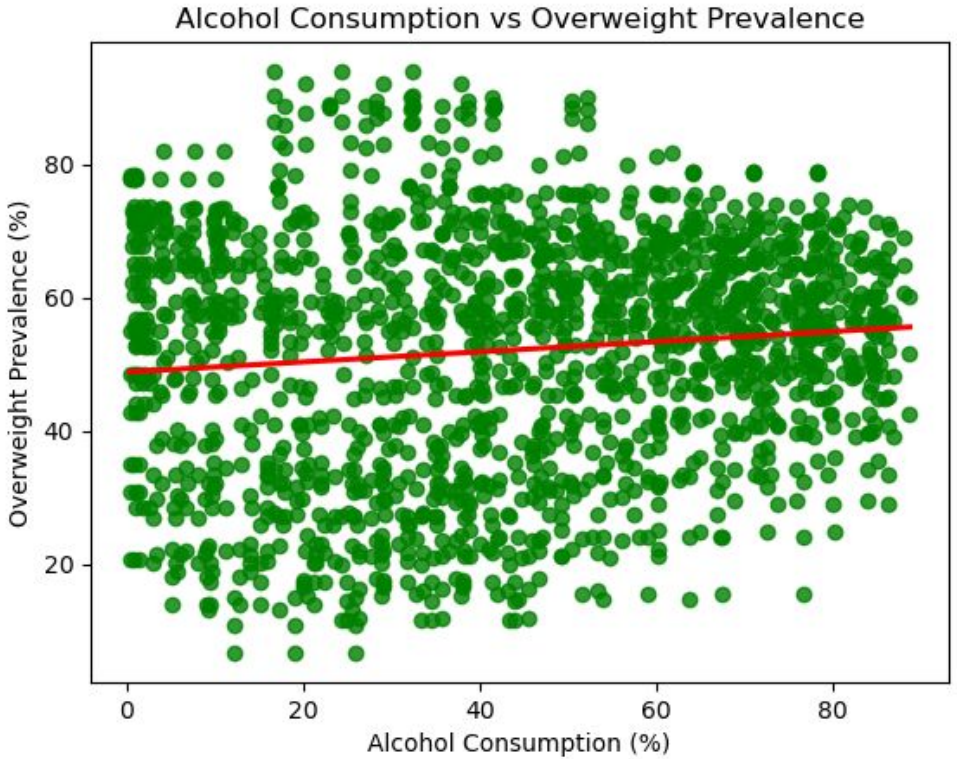


Alcohol Consumption and Overweight Prevalence

Spearman Correlation: 0.08376211764865812

	Value_alcohol	Value_overweight
Value_alcohol	1.000000	0.103894
Value_overweight	0.103894	1.000000

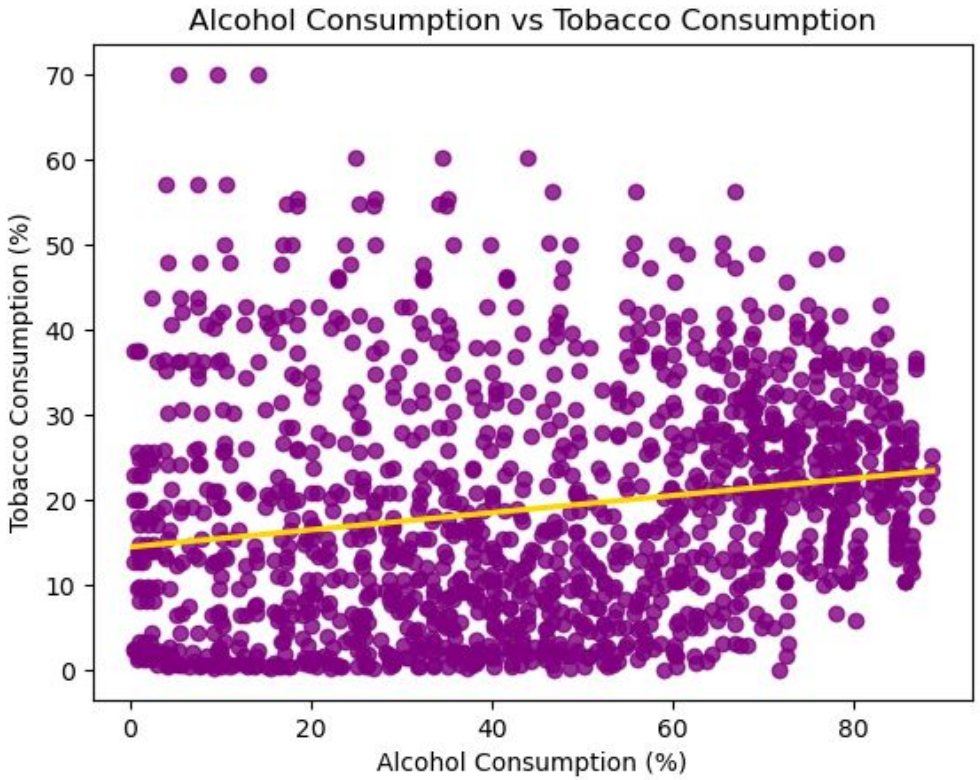
Very weak positive correlation between alcohol consumption and overweight prevalence among countries.



Alcohol Consumption vs Tobacco Consumption

```
Spearman Correlation: 0.25086253974727624
                Value_alcohol  Value_tobacco
Value_alcohol        1.000000       0.186965
Value_tobacco        0.186965       1.000000
```

Moderate positive correlation between alcohol consumption and tobacco consumption



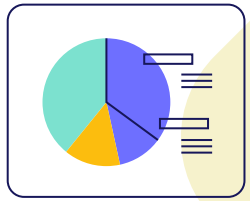
IV.

Interpretation & Real-World Application

Key Insights

- **Alcohol Consumption:** Patterns in alcohol consumption are closely associated with cultural and religious contexts, as well as social norms.
- **Tobacco Consumption:** Tobacco usage is influenced by regional regulations and cultural acceptance, with economic factors also playing a significant role.
- **Physical Activity:** Levels of physical activity may be shaped by factors such as public health initiatives, availability of recreational facilities, and cultural traditions, with some societies exhibiting higher rates of sedentary behavior.
- **Overweight Prevalence:** Dietary habits appear to be a primary determinant of overweight prevalence in different countries. Cultural and economic factors likely have a significant impact on these patterns.

Conclusion



This analysis suggests that health indicators like alcohol and tobacco use, physical activity, and overweight prevalence are strongly influenced by cultural, economic, and regulatory factors. Recognizing these patterns can provide insights into designing more effective health policies and tailored social programs that promote healthier lifestyle choices on a global scale.

Resources

Datasets: World Health Organization, *The Global Health Observatory,* Indicators. Retrieve from: https://www.who.int/data/gho/data/indicators

Wikipedia, (2024) "Religious Composition by Country, in Percentages'". Pew Research. 18 December 2012. Retrieve from: https://www.pewforum.org/2012/12/18/table-religious-composition-by-country-in-percentages/

Thanks!

Do you have any questions?

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